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<i>Invention:</i>	METHOD OF MIXING HIGH TEMPERATURE GASES IN MINERAL PROCESSING KILNS	}
<i>Applicant:</i>	Eric R. Hansen et al.	}
<i>Filed:</i>	November 21, 2003	}
<i>Attorney</i>		}
<i>Docket:</i>	204560-73806	}
<i>Examiner:</i>	Lu, Jiping	}

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REPLY BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Reply Brief is submitted electronically for the application identified above in support of the appeal from the Primary Examiner's November 29, 2006 fifth rejection of claims 1-29 and 31-34. Please charge any additional fees or credit any overpayments to Deposit Account No. 10-0435, with reference to our file number 204560-73806.

STATUS OF CLAIMS

Claims 1-29 and 31-34 are pending in the application, with claim 30 cancelled in the Response to Office Action dated November 30, 2004. Claims 1-29 and 31-34 were rejected in the final Office Action dated November 29, 2006 and are appealed. A copy of the appealed claims is attached to the Claims Appendix of Appellants in the Appeal Brief previously filed on October 1, 2007.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The following four grounds of rejection are presented for review:

(1) the rejection of claims 26-29 and 31-34 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,584,850 issued to Brandvold (hereinafter "Brandvold");

(2) the rejection of claims 1-18 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 3,488,700 issued to Iken et al. (hereinafter "Iken") in view of U.S. Patent No. 4,255,115 issued to Graat et al. (hereinafter "Graat");

(3) the rejection of claims 1-25 under 35 U.S.C. § 103(a) as being obvious over Brandvold in view of Graat;

(4) the rejection of claims 1-25 under 35 U.S.C. § 103(a) as being obvious over Brandvold in view of U.S. Patent No. 5,413,476 issued to Baukal, Jr. et al. (hereinafter "Baukal").

ARGUMENT

FORWARD

The length of this Reply Brief is necessitated by the new bases for rejection raised by the Examiner in her Examiner's Answer. More specifically, because the Examiner materially changed the basis of many of her rejections in the Examiner's Answer, a thorough rebuttal of these new arguments raised by the Examiner is necessitated. As described below in greater detail, some of these "new" bases of rejection are not new at all, but rather are merely bases that have been presented by the Examiner before, rebutted by the Appellants, subsequently abandoned by the Examiner, and now recycled and revived by the Examiner in her Examiner's Answer. In an effort to contain the size of this Reply Brief, Appellants have made every effort to simply cite to those earlier occasions in lieu of repeating them in complete detail in this Reply Brief.

I. THE BOARD IS URGED TO REVERSE THE FIRST GROUND OF REJECTION.

The claims within the first ground of rejection will be argued separately in the following groups:

Group A – claims 26-29

Group B – claims 31-34

A. Claims 26-29 Are Not Anticipated by Brandvold.

On p.8 of the Examiner's Answer dated December 31, 2007, the Examiner stated with regard to the rejection of claims 26-29 that "Examiner agrees that Figs. 1-4 and Fig. 5 are different embodiments and now focus only on Figs. 1-4 for the rejection under § 102."

Appellants understand this to mean that the Examiner concedes that he has been improperly picking and choosing between the different embodiments disclosed in Brandvold, and that the initial basis of his 11/29/2006 fifth rejection of claims 26-29 was therefore in error.

On pp.8-9 of the Examiner Answer, the Examiner modified her rejection to recycle a faulty legal argument that Appellants answered long-ago:

The examiner disagrees with applicant's narrow interpretation of the prior art patent to Brandvold *in view of the broad claims at issue*. It is the examiner's position that the Brandvold clearly shows the broadly claim[ed] features, namely; a. an inclined rotary vessel 12 with an air inlet opening 24a-e located between the upper (at 14a) and lower (at 14b) ends of the vessel 12; b. *a stationary preheating/precalcining assembly 20, 20c, 20d, positioned proximate to the upper end (at 14a) of the rotary vessel 12 for charging or conveying minerals 10 into the rotary vessel 12...* (emphasis added).

Respectfully, the Examiner made this exact same argument over two years ago, but, as the Appellants pointed out then, the rejection is based on a faulty understanding of the legal standard outlined in MPEP § 2111. See 9/8/06 Appeal Brief, p.11-12. MPEP § 2111, quoting *In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000), instructs that “during examination proceedings, claims are given their broadest reasonable interpretation consistent with the specification.” When the proper legal standard is applied, the rejection of claims 26-29 is clearly improper and should be reversed.

The Examiner, however, has refused to apply the proper legal standard and significantly delayed resolution of this matter. The Examiner has indicated that the “feeding means 20” (i.e., the combination of feeder 20b, chute 20c, and the feed tube 20d) of Brandvold read on the claimed preheating/precalcining assembly. Appellants showed during the first appeal almost two years ago this overly broad interpretation of “preheating/precalcining assembly” misapplied the legal standard. See 9/8/06 Appeal Brief, p.11-12. The Examiner’s rejection ignores the interpretative guidance afforded by the appellants’ written description and fails to use the terms “as they would be understood by one of ordinary skill in the art.” See *id.* (citing *In re Hyatt*, 211 F.3d at 1372s; *In re Morris*, 127 F.3d 1048, 1054-55 (Fed. Cir. 1997); MPEP §. 2111). When confronted with these arguments on the first appeal, the Examiner chose to reopen prosecution rather than allow this case to proceed to a resolution and dropped this basis for rejecting claims 26-29. See 11/29/06 Office Action, p.3 (using the “preheater or precalcining assembly 38” of FIG. 5, and not the “feeding means 20,” to reject claims 26-29). Now, when faced with the undisputed fact that FIGS. 1-4 and FIG. 5 are different embodiments in Brandvold, the Examiner has again returned to her unreasonably broad interpretation of “preheating/precalciner assembly” in an effort to maintain her rejection – stating now that the “broadly claimed preheating/precalciner assembly is nothing but a material preheating assembly to recover outgoing waste exhaust heat.” Examiner’s Answer, p.9.

Yet the fact remains that neither the written description of the present application nor the term’s common usage in the art would lead one skilled in the art to believe that the claimed “preheating/precalcining assembly” means the material feeding means 20 disclosed in Brandvold. As the Examiner has acknowledged, “the term regarding ‘preheating/precalciner assembly’ is well known in the art. The claimed ‘preheating/precalciner assembly is nothing but a cyclone separator and a separate calciner connected in series as shown in the current application as FIGS. 17-20.” 2/8/06 Final Office Action, p.9, lns.15-18. Despite conceding that the term is well known in the art, the Examiner continues to give it an interpretation that is overly broad. Thus, this rejection is

inconsistent with both the guidelines listed in MPEP § 2111 and judicial guidance provided by the *Hyatt / Morris* line of cases.

For the above reasons, the Board is urged to reverse the rejection of claims 26-29.

B. Claims 31-34 Are Not Anticipated by Brandvold.

Like her argument with regard to claims 26-29, the Examiner has conceded she has been improperly picking and choosing between the different embodiments disclosed in Brandvold. *See* Examiner's Answer, p. 11. She has now changed her position with regard to the rejection of claims 31-34, but, again, her rejection should be reversed.

Throughout this prosecution, the Examiner has admitted that Brandvold does not disclose a feed assembly that is operable to heat lime mineral by contact with a kiln gas stream advancing therethrough. *See, e.g.,* 2/8/06 Final Office Action, p.3 ("It is noted that the incoming mineral passes inlet chute 20d and is indirectly heated by the existing hot flue gas in vessel 22a."); p.10 ("[T]he mineral feed assembly 22a, 20d is operable to heat incoming lime mineral by existing hot exhaust gas thru heat conduction and radiation."). Despite these admissions, the Examiner now argues that Brandvold shows "direct contact between the hot exhaust gas stream and the incoming cold lime 10 inside chute or feed tube 20d since [a] portion of the hot waste exhaust gas stream travels or flows into the chute or feed tube 20d through material outlet end of 20d." Examiner's Answer pp.10-11. Respectfully, the Examiner's previous position was correct: Brandvold does not disclose either expressly or inherently a feed assembly that is operable to heat lime mineral by contact with a kiln gas stream advancing therethrough.

The Federal Circuit has said that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987); *see* MPEP § 2131. Brandvold expressly teaches the raw material pellets 10 are fed into the "drying means 18 (FIGS. 1, 2) adjacent the inlet 14a of the rotary kiln 14 for heating the raw material pellets 10 by the heated fluid to substantially remove the moisture in the raw material pellets 10." Brandvold, col. 6, lns 20-24. The specification of Brandvold does not expressly disclose that the raw material pellets 10 are heated while still within the feeding tube 20d.

Nor does Brandvold support an anticipation rejection based on inherency. In *Continental Can Co. v. Monsanto Co.*, the Federal Circuit stated that

To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must *make clear that the missing descriptive matter is necessarily present* in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. 948 F.2d 1264, 1269 (Fed. Cir. 1991) (quoting *In re Oelrich*, 666 F.2d 578, 581 (C.C.P.A. 1981)) (emphasis added).

948 F.2d 1264, 1269 (Fed. Cir. 1991) (quoting *In re Oelrich*, 666 F.2d 578, 581 (C.C.P.A. 1981)) (emphasis added). Here, the gas stream *might* flow into the feeding tube 20d but it is equally probable, if not more probable, that the gas stream *might not* flow into the feeding tube 20d. This is true since, as described at column 7, lines 40-46, the draft fan 28 draws kiln gases through Brandvold's kiln, the back house 22, and exhausts them through the exhaust conduit 28d. The Examiner, on the other hand, speculates that kiln gases would choose a fluid path through the feed tube 20d (despite the fact that the tube 20d is at atmospheric pressure) over the described fluid path in which the kiln gases are drawn through the draft house 22/exhaust conduit 28d by the negative pressure created by the draft fan 28d. This, of course, is not only mere speculation, but, perhaps, mere speculation with an unlikelihood of being accurate. Mere speculation unaccompanied by the extrinsic evidence that makes "clear that the missing descriptive matter is *necessarily* present," *id.*, is insufficient to support a § 102 rejection based on inherency.

In summary, as the Examiner had previously maintained, Brandvold does not disclose either expressly or inherently a feed assembly that is operable to heat lime mineral by contact with a kiln gas stream advancing therethrough. As such, the rejection of claims 31-34 is unsupported by the art and should be reversed.

II. THE BOARD IS URGED TO REVESE THE SECOND GROUND OF REJECTION.

The claims within the second ground of rejection will be separately argued in the following groups:

Group A – claims 1, 2, 4-9, and 11-14

Group B – claims 3 and 10

Group C – claim 15

Group D – claims 16-18

A. Claims 1, 2, 4-9, and 11-14 Are Not Obvious Over Iken and Graat

The legal authorities put forth in 10/1/07 Appeal Brief in regard to the §103 rejections based on Iken and Graat are fully incorporated into this section.

The § 103 rejection of claims 1, 2, 4-9, and 11-14 is improper and should be overruled for at least the following reasons:

- (i) there is no legally sufficient reason to combine the references, and
- (ii) the combination does not arrive at the invention.

(i) There is No Legally Sufficient Reason to Combine the References.

Examiner continues to offer “mere conclusory statements” in place of the explicit analysis of obviousness demanded by *KSR*. See *KSR Int'l. Co. v. Teleflex, Inc.*, 172 S.Ct. 1727, 1741 (2007). On p.12 of the Examiner’s Answer, the Examiner, rather than answering the Appellants’ reasoned legal argument, merely reiterates her previous conclusory justifications:

[A] person of ordinary skilled [sic] in the art would combine Iken and Graat in order to improve the combustion efficiency. Again, it is common practice and common sense to have complete combustion in order to improve efficiency and save fuel.

Appellants do not dispute that a person of ordinary skill seeks to improve combustion efficiency and save fuel, but the Examiner must offer a reasoned analysis to explain what would lead a person of ordinary skill to combine Iken and Graat to accomplish that end. Simply stating that one of ordinary skill would combine the references “to improve efficiency and save fuel” does not satisfy the *KSR* Court’s clear command to provide “some articulated reasoning with some rational underpinning to support the legal conclusion obviousness.” *KSR*, 172 S.Ct. at 1741. Instead, the Examiner has provided merely the very type unsupported, conclusory statement condemned in *KSR*. See *id.* Thus, the Examiner has failed to engage in the explicit analysis demanded by *KSR*; as such, the Examiner’s § 103 rejection of claims 1, 2, 4-9, and 11-14 is unsustainable.

Nor does the Examiner’s Answer adequately address Appellants’ argument that the prior art as a whole teaches away from the proposed combination of Iken and Graat. In response to Appellants’ argument, the Examiner asserts that Appellants’ claim 1

[M]ention[s] nothing about “cold air” or “preheated air”. Therefore, this line of arguments is not germane to the broad claims at issue. Moreover, Patent to Graat et al. teaches that the hot gas generators can be fed not only with cold air, but may be used also in a direct process for the heating or drying (col. 6, lines 1-3)

Examiner’s Answer, p. 13 (emphasis added). As explained on p.12 of Appellants’ 10/1/07 Appeal Brief, no one skilled in the art would modify the kiln of Iken to include the air supply of Graat because Graat introduces a cold air stream directly into the flame. Iken expressly teaches increasing the temperature of the secondary air stream “prior to [it] coming into contact with the flame.” Iken, col. 3, lns. 11-15. Graat must introduce its stream of *cold air directly* into the flame in order to produce sufficient heating. Graat, col. 2, lns. 4-12. Graat also teaches that the stream could be a

liquid substance or an inert combustion gas, Graat, col. 6, lns. 1-9, but regardless of how the stream is defined, it must be introduced directly into the flame to produce the desired results, directly conflicting with the teaching of Iken. One skilled in the art would not go through the effort and expense to modify Iken's kiln with Graat's air introduction mechanism since it would be merely redundant hardware and would actually inject cold air into the flame in direct contradiction with Iken's teaching. The conflict between the two references cannot be clearer, and the Examiner's conclusory analysis does nothing address the overwhelming reasons against such a combination.

Moreover, the highlighted passage from the Examiner's Answer makes clear what Appellants have respectfully asserted all along: the Examiner is using the Appellants' application as a roadmap in developing her rejection. Whether claim 1 mentions "cold air" or "preheated air" is not the point; rather, the Examiner "must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another." MPEP § 2143.01.III (citing *In re Young*, 927 F.2d 588 (Fed. Cir. 1991)). The content of the Appellants' claims should not enter into the analysis of the prior art, and making reference to the claims only supports the conclusion that the Examiner is improperly relying on hindsight reasoning to support her rejection of the claims under 35 U.S.C. § 103(a).

(ii) The Proposed Combination Does Not Arrive at the Invention.

On p. 13 of the Examiner's Answer, the Examiner asserts that

[The appellant argues that the proposed combination does arrive at the invention. The appellant keeps arguing about the deficiencies of each separate prior art reference but fails to recognize the combined teachings of the prior art references.

Respectfully, as the Appellants have shown throughout the prosecution of this case, the combined teaching of the prior art references fails to disclose the use of a sub-stoichiometric air-to-fuel ratio in the lower end of the rotary vessel. *See, e.g.*, 10/1/07 Appeal Brief, p.13. The Examiner concedes Iken does not supply the missing limitation, *see* 11/29/06 Office Action, p.4. Graat undisputedly operates "either under stoichiometric conditions or with an excess of oxygen" but not sub-stoichiometric conditions. *See* Graat, col.4, lns.60-64. Thus, the combined teaching of Graat and Iken cannot arrive at the invention of claims 1, 2, 4-9, and 11-14.

(iii) Conclusion regarding claims 1, 2, 4-9, and 11-14.

In light of the above, the Examiner has not established a proper § 103 rejection with regard to Appellants' claims 1, 2, 4-9, and 11-14. As such, the rejection of claims 1, 4-9, and 11-14 should be reversed.

B. Claims 3 and 10 are not Obvious over Iken and Graat.

The Examiner continues to deny the record establishes that the claimed ranges are not mere design choices. This assertion is belied by reference to p.14 of the 10/1/07 Appeal Brief alone, but the Appellants' specification, numerous Responses to Office Actions, and the 9/8/06 Appeal Brief have overwhelmingly established that the claimed ranges solve a stated problem in a new or unexpected way. The Examiner's continued ignorance of such portions of the record does not obviate their presence. Thus, the Examiner has not established a prima facie case of obviousness in regard to Appellants' claims 3 and 10, and the Board is urged to reverse the rejection.

C. Claim 15 is not Obvious over Iken and Graat

A proper rejection under §103 has not been established in regard to claim 15 since claim 15 is dependent on claim 14 and, as discussed herein, a proper rejection of claim 14 has not been established. Moreover, a proper rejection has not been established in regard to claim 15 for similar reasons to as above in regard to claims 3 and 10. Namely, Appellants have established on the record why the claimed ranges are not matters of design choice and the Examiner has failed to rebut the same. As such, the rejection of claim 15 should be reversed.

D. Claims 16-18 are not Obvious over Iken and Graat

A proper rejection under §103 has not been established in regard to claims 16-18 since claims 16-18 are dependent on claim 14 and, as discussed herein, a proper rejection of claim 14 has not been established. Moreover, a proper rejection has not been established in regard to claims 16-18 since neither Iken nor Graat disclose an air nozzle extending into the rotary vessel through an opening in the wall of the rotary vessel with such a nozzle being used to create super-stoichiometric conditions in the mid-portion of the rotary vessel. As such, the rejection of claims 16-18 should be reversed.

III. THE BOARD IS URGED TO REVERSE THE THIRD GROUND OF REJECTION.

The claims within the third ground of rejection will be separately argued in the following groups:

Group A – claims 1, 2, 4-9, and 11-14

Group B – claims 3 and 10

Group C – claim 15

Group D – claims 16-18

Group E – claims 19, 21, and 23-25

Group F – claim 20

Group G – claim 22

A. Claims 1, 2, 4-9, and 11-14 are not Obvious over Brandvold and Graat

The § 103 rejection of claims 1, 2, 4-9, and 11-14 is improper and should be overruled for at least the following reasons:

- (i) there is no legally sufficient reason to combine the references, and
- (ii) the combination does not arrive at the invention.

(i) There is No Legally Sufficient Reason to Combine the References

The legal authorities put forth in 10/1/07 Appeal Brief and above in regard to the §103 rejections based on Iken and Graat are fully incorporated into this section.

On pp.16-17 of the Examiner's Answer, the Examiner, rather than answering the Appellants' reasoned legal argument, merely reiterates her previous conclusory statements to support this rejection:

[A] person of ordinary skilled [sic] in the art would combine[] Brandvold and Graat in order to improve the combustion efficiency. Again, it is common practice and common sense to have complete combustion in order to improve efficiency and save fuel.

Again, simply stating that one of ordinary skill would combine the references "to improve efficiency and save fuel" does not satisfy the KSR Court's clear command to provide some articulated reasoning with some rational underpinning to support the legal conclusion obviousness. The Examiner has provided no evidence or analysis to explain what would lead a person of ordinary skill to combine Brandvold and Graat.

Similarly, the Examiner does not adequately address Appellants' argument that the prior art as a whole teaches away from the proposed combination of Brandvold and Graat. *See* 10/1/07 Appeal Brief, p.18. Instead, the Examiner uses the Appellants' claims in formulating her answer, stating that

The broad claims at issue fail to define any distance. Therefore, this line of argument is not germane to the broad claims at issue. The combination does arrive at the broadly claimed invention. Furthermore, the applicant's own device also shows the secondary air 38 located at a far distance from the burner 24 identical to the prior art Brandvol[d] patent's secondary air 14a-e and burner 16.

Respectfully, what Appellants' device shows or Appellants' claims define is not relevant to the Examiner's analysis of whether the prior art as a whole teaches away from the proposed combination. The Examiner must look at *each reference*, not Appellants' claims, to determine whether the references as a whole teach away from combination. The Examiner does not dispute that the cold stream of Graat must be introduced directly into the flame. Air introduced through the air inlet 24e of the Brandvold kiln is not directed into the flame of the kiln's burner; rather, the air is introduced at a location tens, if not hundreds, of feet away from the flame. *See* 10/1/07 Appeal Brief, p.18-19 (citing Brandvold, col. 1, lns. 8-13). Graat's flame system will not perform its intended function in such a combination. *See* 10/1/07 Appeal Brief, p.18-19 (citing Graat, col. 2, lns. 4-12). The Fed. Cir. has said the prior art teaches away when a proposed combination of the prior art renders the prior art invention "inoperable for its intended purpose." *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). Thus, the proposed combination is not proper and a prima facie case of obviousness has not been established.

Moreover, the reference to the Appellants' claims in the Examiner's Answer makes clear what Appellants have respectfully asserted all along: the Examiner is using the Appellants' application as a roadmap in developing her rejection. The content of the Appellants' claims should not enter into the analysis of the prior art, and making reference to it only supports the conclusion that the Examiner is improperly relying on hindsight reasoning to support her rejection of the claims under 35 U.S.C. § 103(a).

(ii) The Proposed Combination Does Not Arrive at the Invention.

As Appellants have shown throughout the prosecution of this case, the combined teaching of the prior art references fails to disclose the use of a sub-stoichiometric air-to-fuel ratio in the lower end of the rotary vessel. *See, e.g.*, 10/1/07 Appeal Brief, p. 19. The Examiner concedes Brandvold does not supply the missing limitation, *see* 11/29/06 Office Action, p.5. Graat operates "either under stoichiometric conditions or with an excess of oxygen" but not sub-stoichiometric conditions. *See*

Graat, col.4, lns.60-64. Thus, the combined teaching of Graat and Brandvold cannot arrive at the invention of claims 1, 2, 4-9, and 11-14.

(iii) Conclusion regarding claims 1, 2, 4-9, and 11-14

Based on the above, the Examiner has not established a proper § 103 rejection with regard to Appellants' claims 1, 2, 4-9, and 11-14. As such, the rejection of claims 1, 2, 4-9, and 11-14 should be reversed.

B. Claims 3 and 10 are not Obvious over Brandvold and Graat

A proper rejection under §103 has not been established in regard to claims 3 and 10 for similar reasons to as above in regard to the §103 rejections of claims 3 and 10 based on Iken and Graat, the entirety of such arguments being incorporated into this section. Namely, Appellants have established on the record why the claimed ranges are not matters of design choice and the Examiner has failed to rebut the same. As such, the rejection of claims 3 and 10 should be reversed.

C. Claim 15 is not Obvious over Brandvold and Graat

A proper rejection under §103 has not been established in regard to claim 15 since claim 15 is dependent on claim 14 and, as discussed herein, a proper rejection of claim 14 has not been established. Moreover, a proper rejection has not been established in regard to claim 15 for similar reasons to as above in regard to claims 3 and 10. Namely, Appellants have established on the record why the claimed ranges are not matters of design choice and the Examiner has failed to rebut the same. As such, the rejection of claim 15 should be reversed.

D. Claims 16-18 are not Obvious over Brandvold and Graat

A proper rejection under §103 has not been established in regard to claims 16-18 since claims 16-18 are dependent on claim 14 and, as discussed herein, a proper rejection of claim 14 has not been established. Moreover, a proper rejection has not been established in regard to claims 16-18 since the Examiner has not shown where either Brandvold or Graat discloses an air nozzle extending into the rotary vessel through an opening in the wall of the rotary vessel with such a nozzle being used to create super-stoichiometric conditions in the mid-portion of the rotary vessel. As such, the rejection of claims 16-18 should be reversed.

E. Claim 19, 21, & 23-25 are not Obvious over Brandvold and Graat

The §103 rejection of claims 19, 21, and 23-25 is improper and should be reversed for at least the following reasons:

- (i) there is no legally sufficient reason to combine the references, and
- (ii) the combination does not arrive at the invention.

(i) There is No Legally Sufficient Reason to Combine the References

The arguments put forth above in section III.A(i) relating to the lack of a legally sufficient reason to combine are relevant to the rejection of claims 19, 21, and 23-25 and are incorporated in their entirety into Appellants' argument relating to claims 19, 21, and 23-25.

(ii) The Proposed Combination Does Not Arrive at the Invention

Even if, for argument's sake, that the Examiner had offered a legally sufficient reason to combine Brandvold and Graat, such a combination would not arrive at the invention of claims 19, 21, and 23-25. While the Examiner effectively conceded he has been improperly picking and choosing between the different embodiments disclosed in Brandvold by changing her rejection to rely solely on FIGS. 1-4, her rejection should still be reversed. In the above arguments relating to the § 102 and § 103 rejections involving Brandvold, Appellants traversed the rejections based on Brandvold by pointing to a number of structural and process differences, with such distinctions not being repeated in this section for purposes of brevity. Graat does not cure such deficiencies. As a result of this, a prima facie case of obviousness has not been established in regard to claims 19, 21, and 23-25 since the combination does not arrive at the invention.

(iii) Conclusion regarding claims 19, 21, and 23-25

Based on the above, the Examiner has not established a proper § 103 rejection with regard to Appellants' claims 19, 21, and 23-25. As such, the rejection of claims 19, 21, and 23-25 should be reversed.

F. Claim 20 is not Obvious over Brandvold and Graat

A proper rejection under § 103 has not been established in regard to claim 20 since claim 20 is dependent on claim 19 and, as discussed herein, a proper rejection of claim 19 has not been established. The arguments put forth above in section III.A(ii) relating to the fact that the proposed combination of Brandvold and Graat does not arrive at the invention are relevant to the rejection of

claim 20 and are incorporated in their entirety into Appellants' argument relating to claim 20. As such, the rejection of claim 20 should be reversed.

G. Claim 22 is not Obvious over Brandvold and Graat

A proper rejection under § 103 has not been established in regard to claim 22 since claim 22 is dependent on claim 19 and, as discussed herein, a proper rejection of claim 19 has not been established. Moreover, a proper rejection has not been established in regard to claim 22 for similar reasons to as above in regard to claims 3 and 10. Namely, Appellants have established on the record why the claimed ranges are not matters of design choice and the Examiner has failed to rebut the same. As such, the rejection of claim 22 should be reversed.

IV. THE BOARD IS URGED TO REVERSE THE FOURTH GROUND OF REJECTION.

The claims within the fourth ground of rejection will be separately argued in the following groups:

Group A – claims 1, 2, 4-9, and 11-14

Group B – claims 3 and 10

Group C – claim 15

Group D – claims 16-18

Group E – claims 19, 21, and 23-25

Group F – claim 20

Group G – claim 22

A. Claims 1, 2, 4-9, and 11-14 are not Obvious over Brandvold and Baukal

The § 103 rejection of claims 1, 2, 4-9, and 11-14 is improper and should be overruled for at least the following reasons:

- (i) there is no legally sufficient reason to combine the references, and
- (ii) the combination does not arrive at the invention.

(i) There is No Legally Sufficient Reason to Combine the References

The legal authorities put forth in 10/1/07 Appeal Brief and above in regard to the §103 rejections based on Iken and Graat are fully incorporated into this section.

On p.21 of the Examiner's Answer, the Examiner, rather than answering the Appellants' reasoned legal argument, merely reiterates her previous conclusory justifications:

[A] person of ordinary skilled [sic] in the art would combine Brandvold and Baukal in order to improve the combustion efficiency. Again, it is common practice and common sense to have complete combustion in order to improve efficiency and save fuel.

Again, simply stating that one of ordinary skill would combine the references "to improve efficiency and save fuel" does not satisfy the *KSR* Court's clear command to provide some articulated reasoning with some rational underpinning to support the legal conclusion obviousness. The Examiner has provided no evidence or analysis to explain what would lead a person of ordinary skill to combine Brandvold and Baukal.

Similarly, the Examiner does not adequately address Appellants' argument that the prior art as a whole teaches away from the proposed combination of Brandvold and Baukal. *See* 10/1/07 Appeal Brief, p.23-24. Instead, the Examiner again uses the Appellants' claims in formulating her answer, stating that "the broad claims at issue fail to define any distance. Therefore, this line of argument is not germane to the broad claims at issue." Examiner's Answer, p.21. Respectfully, what Appellants' device shows or Appellants' claims define is not relevant to the Examiner's analysis of whether the prior art as a whole teaches away from the proposed combination. The Examiner must look at *each reference*, not Appellants' claims, to determine whether the references as a whole teach away from the combination. The Examiner does not dispute that Baukal teaches introducing the oxygen directly into the flame. Air introduced through the air inlet 24e of the Brandvold kiln is not directed into the flame of the kiln's burner; rather, the air is introduced at a location tens, if not hundreds, of feet away from the flame. *See* 10/1/07 Appeal Brief, p.23-24 (citing Brandvold, col. 1, lns. 8-13). Baukal's flame system will not be able to perform its intended function in such a combination. *See* 10/1/07 Appeal Brief, p.23-24 (citing Baukal, col. 4, lns. 36-46). The Fed. Cir. has said the prior art teaches away when a proposed combination of the prior art renders the prior art invention "inoperable for its intended purpose." *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). Thus, the proposed combination is not proper and a prima facie case of obviousness has not been established.

Moreover, the reference to the Appellants' claims in the Examiner's Answer makes clear what Appellants have respectfully asserted all along: the Examiner is using the Appellants' application as a roadmap in developing her rejection. The content of the Appellants' claims does not enter into the analysis of the prior art, and making reference to it only supports the conclusion that

the Examiner is improperly relying on hindsight reasoning to support her rejection of the claims under 35 U.S.C. § 103(a).

(ii) The Proposed Combination Does Not Arrive at the Invention.

As Appellants have shown throughout the prosecution of this case, the combined teaching of the prior art references fails to disclose the use of a sub-stoichiometric air-to-fuel ratio in the lower end of the rotary vessel. *See, e.g.*, 10/1/07 Appeal Brief, pp.24-25. The Examiner concedes Brandvold does not supply the missing limitation. *See* 11/29/06 Office Action, p.5. Further, the record shows that Appellants fully briefed and demonstrated how Baukal neither expressly nor inherently teaches the creation of sub-stoichiometric conditions, and the Examiner has never rebutted these arguments. As a result, the combined teaching of Baukal and Brandvold cannot arrive at the invention of claims 1, 2, 4-9, and 11-14.

(iii) Conclusion regarding claims 1, 2, 4-9, and 11-14

Based on the above, the Examiner has not established a proper § 103 rejection with regard to Appellants' claims 1, 2, 4-9, and 11-14. As such, the rejection of claims 1, 2, 4-9, and 11-14 should be reversed.

B. Claims 3 and 10 are not Obvious over Brandvold and Baukal

A proper rejection under §103 has not been established in regard to claims 3 and 10 for similar reasons to as above in regard to the §103 rejections of claims 3 and 10 based on Iken and Graat, the entirety of such arguments being incorporated into this section. Namely, Appellants have established on the record why the claimed ranges are not matters of design choice and the Examiner has failed to rebut the same. As such, the rejection of claims 3 and 10 should be reversed.

C. Claim 15 is not Obvious over Brandvold and Baukal

A proper rejection under §103 has not been established in regard to claim 15 since claim 15 is dependent on claim 14 and, as discussed herein, a proper rejection of claim 14 has not been established. Moreover, a proper rejection has not been established in regard to claim 15 for similar reasons to as above in regard to claims 3 and 10. Namely, Appellants have established on the record why the claimed ranges are not matters of design choice and the Examiner has failed to rebut the same. As such, the rejection of claim 15 should be reversed.

D. Claims 16-18 are not Obvious over Brandvold and Baukal

A proper rejection under §103 has not been established in regard to claims 16-18 since claims 16-18 are dependent on claim 14 and, as discussed herein, a proper rejection of claim 14 has not been established. Moreover, a proper rejection has not been established in regard to claims 16-18 since the Examiner has not shown where either Brandvold or Baukal discloses an air nozzle extending into the rotary vessel through an opening in the wall of the rotary vessel with such a nozzle being used to create super-stoichiometric conditions in the mid-portion of the rotary vessel. As such, the rejection of claims 16-18 should be reversed.

E. Claim 19, 21, & 23-25 are not Obvious over Brandvold and Baukal

The §103 rejection of claims 19, 21, and 23-25 is improper and should be reversed for at least the following reasons:

- (i) there is no legally sufficient reason to combine the references, and
- (ii) the combination does not arrive at the invention.

(i) There is No Legally Sufficient Reason to Combine the References

The arguments put forth above in section IV.A(i) relating to the lack of a legally sufficient reason to combine are relevant to the rejection of claims 19, 21, and 23-25 and are incorporated in their entirety into Appellants' argument relating to claims 19, 21, and 23-25.

(ii) The Proposed Combination Does Not Arrive at the Invention

Even if, for argument's sake, that the Examiner had offered a legally sufficient reason to combine Brandvold and Baukal, such a combination would not arrive at the invention of claims 19, 21, and 23-25. While the Examiner effectively conceded he has been improperly picking and choosing between the different embodiments disclosed in Brandvold by changing her rejection to rely solely on FIGS. 1-4, her rejection should still be reversed. In the above arguments relating to the § 102 and § 103 rejections involving Brandvold, Appellants traversed the rejections based on Brandvold by pointing to a number of structural and process differences, with such distinctions not being repeated in this section for purposes of brevity. Baukal does not cure such deficiencies. As a result of this, a prima facie case of obviousness has not been established in regard to claims 19, 21, and 23-25 since the combination does not arrive at the invention.

(iii) Conclusion regarding claims 19, 21, and 23-25

Based on the above, the Examiner has not established a proper § 103 rejection with regard to Appellants' claims 19, 21, and 23-25. As such, the rejection of claims 19, 21, and 23-25 should be reversed.

F. Claim 20 is not Obvious over Brandvold and Baukal

A proper rejection under § 103 has not been established in regard to claim 20 since claim 20 is dependent on claim 19 and, as discussed herein, a proper rejection of claim 19 has not been established. The arguments put forth above in section IV.A(ii) relating to the fact that the proposed combination of Brandvold and Baukal does not arrive at the invention are relevant to the rejection of claim 20 and are incorporated in their entirety into Appellants' argument relating to claim 20. As such, the rejection of claim 20 should be reversed.

G. Claim 22 is not Obvious over Brandvold and Baukal

A proper rejection under § 103 has not been established in regard to claim 22 since claim 22 is dependent on claim 19 and, as discussed herein, a proper rejection of claim 19 has not been established. Moreover, a proper rejection has not been established in regard to claim 22 for similar reasons to as above in regard to claims 3 and 10. Namely, Appellants have established on the record why the claimed ranges are not matters of design choice and the Examiner has failed to rebut the same. As such, the rejection of claim 22 should be reversed.

V. SUMMARY CONCLUSIONS

Accordingly, appellants submit that each of the four grounds of rejection is erroneous. The Board is thus urged to reverse these rejections. Such action is respectfully requested.

Respectfully submitted,
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